

DESCRIPTION OF THE LARVA AND PUPA OF *ARGYRIPA*
LANSBERGEI (SALLÉ) WITH NEW DISTRIBUTIONAL
RECORDS FOR THE GENUS AND A KEY TO NEW
WORLD GYMNETINI LARVAE (COLEOPTERA:
SCARABAEIDAE: CETONIINAE)

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Abstract.—The third instar larva and pupa of *Argyripa lansbergei* (Sallé) are described and illustrated based on specimens from Mexico. New records are given for *A. anomala* (Mexico), *A. gloriosa* (Ecuador), and *A. lansbergei* (Mexico). A key to the larvae of New World Gymnetini is provided.

Ratcliffe (1978) revised and illustrated the four species of the cetoniine genus *Argyripa* which ranged from Chontales, Nicaragua, to Portoviejo, Ecuador. During recent collecting near the Tacana Volcano, Chiapas, Mexico, Morón found larvae that, after being laboratory reared, emerged as *Argyripa lansbergei* adults. In addition, Luis González-Cota collected two adult specimens of *A. anomala* (Bates) in Veracruz and Oaxaca states, Mexico. Lastly, Ratcliffe found additional Mexican specimens of both of these species in the collections of the Museum für Naturkunde in Berlin. These new records clearly indicate the presence of this Neotropical genus in Mexico, about 1200 km to the NW of its previously known occurrence.

DESCRIPTIONS

Six larvae of *A. lansbergei* were preserved in the field upon collection in March 1982. The remaining ten specimens were placed in individual plastic containers with 250 grams of organic bedding composed of equal portions of black soil, milled rotten wood, and pulverized dry cow dung. The rearing containers containing larvae were maintained at $20 \pm 3^\circ \text{C}$ for seven months until all the adults had emerged. One third instar larva collected on 9 March reached the adult stage on 3 May. The remaining eight larvae formed pupal cells from 30 June to 11 September. One specimen died. The egg-shaped pupation cells constructed by the larvae remained intact for 60–105 days after which the adults began to emerge (Fig. 14). From lab reared, third stage larvae, adults were recovered in May (one specimen), August (one specimen), September (one specimen), and October (four specimens).

Technical terms and abbreviations used in the text and figures are those of

Ritcher (1966). The larvae and adults studied in this project are deposited in the M. A. Morón Collection/Museo de Historia Natural de la Ciudad de México, and in the B. C. Ratcliffe Collection.

Argyripa lansbergei (Sallé)

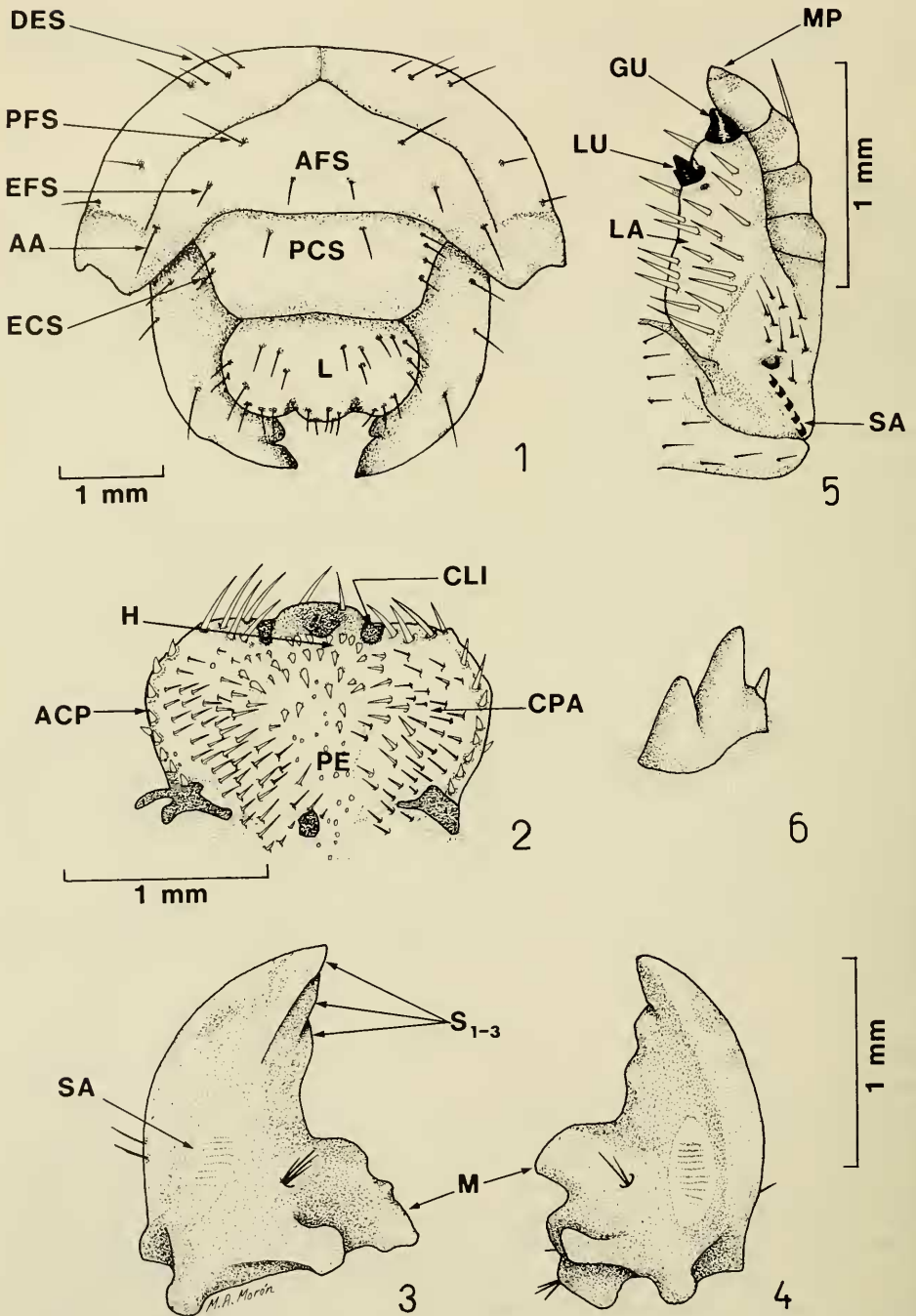
Figs. 1–13

Third instar larva.—This description is based on the following material: six third instar larvae, two cast skins of third instar larvae reared to the pupal stage, and seven cast skins of third instar larvae reared to the adult stage. All 15 larvae collected in MEXICO: State of Chiapas, Cacaohatán Municipality, Finca San José de la Victoria, 9-III-1982, M. A. Morón & R. Terrón, in rich organic soil under rotten log of *Bursera simaruba* (L.) Sarg. (coffee-cacao plantation surrounded by tropical rain forest, 430 m altitude).

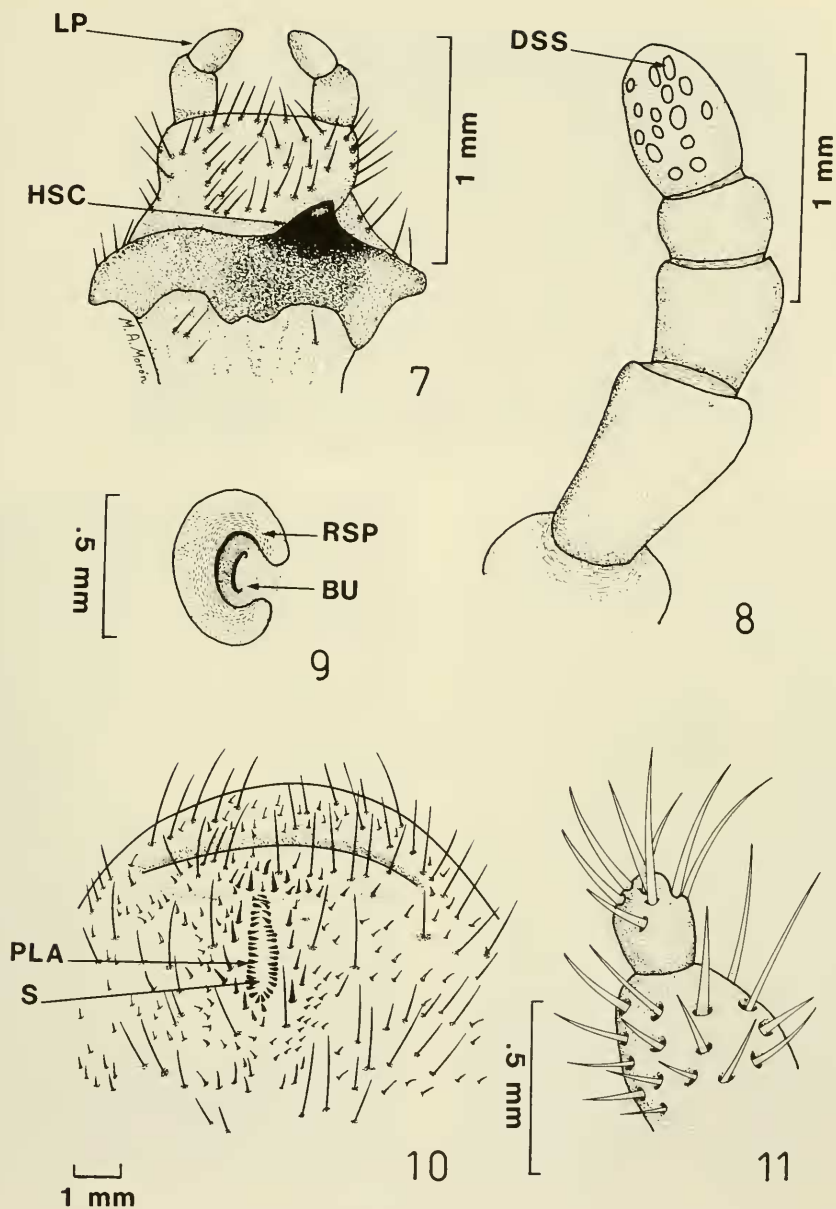
Head (Fig. 1): Maximum width of head capsule 4.0–4.3 mm. Surface of cranium smooth to slightly roughened, yellowish. Frons with one posterior frontal seta, one exterior frontal seta, one anterior frontal seta, and one anterior angle seta on each side. Dorsoepicranial seta consisting of 2 large and 1–4 small setae on each side. Clypeus with one posterior clypeal seta and 2–4 exterior clypeal setae on each side. Labrum (Fig. 2) trilobed, with 8–11 large setae on each side; clithra present. Haptomeral region of epipharynx with transverse row of 7–8 conical setae below haptomeral transverse process. Right chaetoparia with 15–18 large median setae and 30–36 slender external setae. Left chaetoparia with 12–15 large median setae and 21–25 slender external setae. Pedium with 8–12 sensilla and 4–7 conical setae. Left acanthoparia with 9–10 conical setae. Right acanthoparia with 8–9 conical setae. Acroparia with 5–7 long stout setae on each side. Each mandible (Figs. 3–4) with 3 scissorial teeth, bilobed molar areas well developed, and small oval stridulatory areas poorly marked by very fine ridges. Maxillary stridulatory area (Fig. 5) consisting of a row of 5 curved teeth with anteriorly projecting points and an anterior truncate process. Lacinia of maxilla (Fig. 6) with 2 terminal unci fused basally, dorsal uncus much larger, dorsobasal expansion with a conical seta that often appears as third uncus (Fig. 6). Galea with large, terminal uncus. Hypopharyngeal sclerome (Fig. 7) heavily sclerotized, with right process moderately developed. Last antennal segment (Fig. 8) with 10–15 dorsal sensory spots.

Thorax: Spiracles (Fig. 9) 0.51–0.56 mm long, 0.29–0.37 mm wide. Respiratory plate with maximum of 36 very small, externally irregular, internally slit-shaped “holes” along any diameter; holes not in definite rows. Distance between two lobes of respiratory plate slightly less than dorsoventral diameter of bulla.

Abdomen: Spiracles 1–8 similar in size. Dorsum of abdominal tergum 7 divided into 3 annulets; dorsum of tergum 8 with 2 annulets. Each annulet covered with short, stiff setae and fringed posteriorly with long setae. Segments 9–10 fused dorsally, covered with short, stiff setae and long setae mixed (fused tergum 9 with 2–3 transverse rows of long setae clearly defined). Venter of tenth abdominal segment (Fig. 10) posteriorly with paired palidia and tegilla. Each palidium with 23–26 stout, moderately long, somewhat compressed pali in a single, slightly irregular, longitudinal curved row. Pali separated from each other by space equal to or less than width of palus at its base. Septula elongated, occasionally open posteriorly, always closed anteriorly. Lower anal lip with 10–12 long setae.



Figs. 1-6. *Argyripa lansbergei*. 1, Frontal view of head of third instar larva (AA—anterior angle seta; AFS—anterior frontal seta; DES—dorsoepicranial seta; ECS—exterior clypeal setae; EFS—exterior frontal seta; L—labrum; PCS—posterior clypeal seta; PFS—posterior frontal seta). 2, Epipharynx (ACP—acanthoparia; CLI—clithrum; CPA—chaetoparia; H—haptomerum; PE—pedium). 3-4, Ventral aspect of right and left mandibles, respectively (M—molar lobes; SA—stridulatory area; S_{1-3} —scissorial teeth). 5, Dorsal aspect of right maxilla (GU—uncus of galea; LA—lacinia; LU—unci of lacinia; MP—maxillary palpus; SA—stridulatory area). 6, Unci of right lacinia, enlarged.

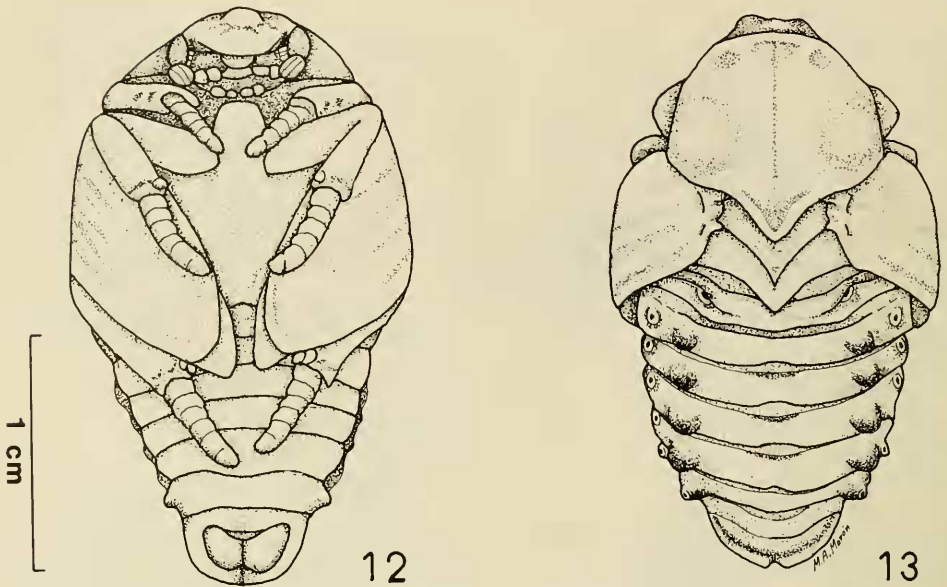


Figs. 7–11. *Argyripa lansbergei*. 7, Ventral view of labium and hypopharyngeal sclerite (HSC—hypopharyngeal sclerite; LP—labial palpus). 8, Right antenna, dorsal view (DSS—dorsal sensory spots). 9, Left thoracic spiracle (BU—bulla; RSP—respiratory plate). 10, Venter of tenth abdominal segment (PLA—palidia; S—septula). 11, Lateral view of claw of metathoracic leg.

Claws (Fig. 11) cylindrical, rounded apically, bearing 8–9 long setae.

Approximate body length: 23 to 39 mm.

Remarks.—The dorsum of abdominal segment seven with three annulets, the monostichous elliptical palidia combined with the 10–15 dorsal sensory spots on the last antennal segment, and the presence of a haptomeral transverse process



Figs. 12-13. *Argyripa lansbergei*, ventral and dorsal view, respectively, of pupa.

on the epipharynx will serve to separate *Argyripa* larvae from those of *Cotinis mutabilis* (G. & P.), *Cotinis nitida* (L.), *Gymnetina cretacea* (LeC.), and *Gymnetis flavomarginata sallei* Schaum.

Pupa.—The following description is based on one pupa and one advanced prepupa reared from third stage larvae collected in the same location and date cited in the larval description.

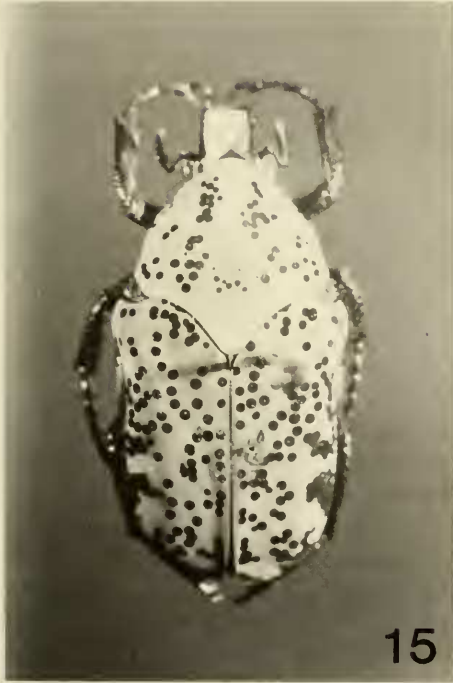
Length 18.0–23.6 mm. Shape subovate, stout, exarate. Color cream-white to yellowish; color becoming reddish as eclosion approaches. Head glabrous, bent downward, mouthparts directed downward. Eyes, antennae, mandibles, and palps clearly discernible; clypeus large, apex broadly rounded. Surface of frons with slight depressions, slightly swollen at vertex.

Pronotum glabrous, subheptagonal in shape, widest posteriorly, basal margin distinctly bisinuated, center base projecting posteriorly as in adult. Pronotal disc slightly convex, much swollen at basal angles, weakly depressed at anterior angles. A narrow, median, longitudinal sulcus extending from apex to near base. Meso- and metascutella acute, projecting posteriorly. Mesosternal process clearly discernible. Elytra closely appressed, curved ventrally around body, extending posteriorly to third abdominal segment, surface with 4 longitudinal sulci.

Abdominal spiracles clearly exposed, last pair situated on rounded tubercles. Each abdominal tergum at side with a distinct, rounded tubercle, most developed on visible terga 3–6.

Legs glabrous. Fore- and mesofemora extend at approximately 70°–90° from longitudinal axis of body; metafemora covered by elytra and wings. Tarsomeres and pretarsus distinct.

Remarks.—The pupa is remarkable because of the presence of pronotal swellings and dorsolateral tubercles on the abdominal segments. The abdominal tubercles



Figs. 14–16. 14, *Argyrripa lansbergei*, adult female emerging from pupal cell. 15, *Argyrripa lansbergei*, adult male from Chiapas, Mexico. 16, *Argyrripa anomala*, adult male from Oaxaca, Mexico.

are particularly interesting because they have not been previously reported in New World Gymnetini. The swellings and/or tubercles may serve to support the pupa within the pupal chamber as has been noted for some *Onthophagus*, *Copris*, *Liatongus*, and *Coprophanaeus* (Edmonds and Halffter, 1978), *Termitodius araujo* Reyes-Castillo and Martínez (Reyes-Castillo and Martínez, 1979), and *Trichillum adisi* Ratcliffe (Ratcliffe, 1980).



Fig. 17. Distribution of the species of *Argyripa*.

NEW DISTRIBUTION RECORDS AND BIOGEOGRAPHICAL NOTES

The revised and expanded distribution for the species of *Argyripa* is shown in Fig. 17. This pattern of distribution is characteristic of Halffter's (1976) "typical Neotropical dispersal pattern" wherein South American taxa have recently (post-Pliocene, less than 5.7 million years before the present) penetrated into the Mexican Transition Zone via Central America. Dispersal northward by tropical taxa into Mexico has been limited largely, though not exclusively, to areas of humid forests (100–2000 meters in elevation) south of the Transverse Volcanic System (approx. 18–19°N latitude) and in the coastal plains of both Mexican coastlines. Rain forests of tropical Mexico contain a low percentage of endemic taxa, and the majority of these are of Central American origin (Rzedowsky, 1962 in Toledo (1982)).

Argyripa lansbergei (Sallé)

Argyripa lansbergei was previously known only from Colombia and Ecuador (Ratcliffe, 1978). It is here reported from Mexico for the first time. These new records are: "MEXICO: Chiapas, Cacaohatán, Finca San José de la Victoria, III-9-1982, M. Morón & R. Terrón." Fifteen specimens in the collections of Miguel Morón, Brett C. Ratcliffe, and the Museo de Historia Natural de la Ciudad de México. "MEXICO: Chiapas, Hidalgo San Antonio." One specimen in the collections of the Museum für Naturkunde, Berlin.

The Mexican occurrence of *Argyripa lansbergei* places this species in Mesoamerica and represents a considerable disjunction in range from its previously known occurrence in NW South America. This discovery is even more surprising when one considers that much of Central America has been intensively, albeit selectively, collected over the past half century. We believe that, in view of the current data, it is not unreasonable to expect new records for this taxon in other areas of Central America where suitable habitat still exists. Alternatively, the Chiapas specimens may be indicative of a relictual distribution resulting from Pleistocene forest refugia in Mexico. Toledo (1982) has found two such presumed refugia in Chiapas based on phytogeographic evidence. Further data are needed to corroborate such a hypothesis.

Argyripa anomala (Bates)

This species is known from Panama, Costa Rica, and Nicaragua (Ratcliffe, 1978). We report its occurrence in Mexico: "MEXICO: Veracruz, Santiago Tuxtla, Cerro El Vigía, IX-17-1982, 400 m, L. González-Cota." One specimen in the collection of B. Ratcliffe. "MEXICO: Oaxaca, Chiltepec, El Naranjal, VI-21-1982, 105 m, L. González-Cota." One specimen in the collection of M. Morón. "MEXICO: Chiapas, Tumbala." One specimen in the collections of the Museum für Naturkunde, Berlin. "MEXICO: Chiapas, Ocosingo, VII-IX-1947, 1200 m, M. del Toro." One specimen in the collection of Antonio Martínez.

As with *A. lansbergei*, the Mexican records represent a large range expansion for this species. It seems likely that *A. anomala* may also occur in suitable areas of Central America between Mexico and Nicaragua.

Argyripa gloriosa Ratcliffe

Argyripa gloriosa was described from Colombia. We record it from Ecuador for the first time. Two specimens, lacking any further data than "Ecuador," are in the Francisco Campos collection in the Museum of Natural History, Quito, and in the Phillip Marshall collection in Cave Creek, Arizona. This species remains tantalizingly obscure. Only four specimens are known (despite its vivid metallic coloration), and all of these are females. The male is yet to be described.

KEY TO THE KNOWN THIRD STAGE LARVAE OF NEW WORLD GYMNETINI

(Adapted from Ritcher, 1966 and Monné, 1969)

1. Palidia present 2
- Palidia absent *Gymnetina cretacea* (LeC.)
2. Raster with each palidium consisting of 2 or more irregular rows of pali.
Last antennal segment with 3–7 dorsal sensory spots. Haptomeral process
absent *Cotinis* 3
- Palidia monostichous. Other characters not as above 4
3. Raster with inner row of each palidium set with pali only slightly larger
than those in outer row *C. nitida* (L.)
- Raster with inner row of each palidium having 7–10 pali much stouter
and larger than other pali *C. mutabilis* (G. & P.)
4. Dorsum of abdominal segment 7 with 2 annulets. Haptomeral process
absent. Last antennal segment with 2–6 dorsal sensory spots 5

- Dorsum of abdominal segment 7 with 3 annulets. Transverse haptomeral process present. Last antennal segment with 10–15 dorsal sensory spots *Argyripa lansbergei* (Sallé)
- 5. Maxillary stridulatory area with a row of 3–5 teeth. Claws bearing 10–12 setae *Gymnetis flavomarginata sallei* Schaum
- Maxillary stridulatory area with 6 or more teeth. Claws with less than 10 setae 6
- 6. Maxillary stridulatory area with a row of 7 teeth. Claws bearing 6–7 setae *Blaesia atra* Burm.
- Maxillary stridulatory area with a row of 9 teeth. Claws bearing 5–6 setae *Marmarina tigrina* (G. & P.)

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